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| 09/697,179      | 10/27/2000  | Nobuaki Mitamura     | 1344.1046/JDH       | 4454             |

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| EXAMINER |
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SUCHECKI, KRISTYNA

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| ART UNIT | PAPER NUMBER |
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2882

DATE MAILED: 01/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/697,179

Applicant(s)

MITAMURA ET AL.

Examiner

Krystyna Suchecki

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/27/00 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Election/Restrictions*

1. Claims 8-13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 5.

### *Specification*

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall (US 5,167,444) in view of Shirasaki ("Temperature Independent..."ECOC Document, referred to as "ECOC" herein).
5. Regarding Claims 1 and 5, Figure 2 of Hall teaches an airgap type etalon comprising:
  - a. a fixing member (36) having at least one flat surface; a first parallel member (37), which is transparent to incident light and has parallel flat surfaces, one of said parallel flat surfaces thereof being joined to said flat surface of said fixing member;

- b. at least one second parallel member (40), which has parallel flat surfaces in which a distance between said parallel flat surfaces thereof is greater than a distance between said parallel flat surfaces of said first parallel member, one of the flat surfaces of said second parallel member being joined to said flat surface of said fixing member so as to surround the outer periphery of said first parallel member (Column 4, lines 62-65); and
  - c. a transparent member (38), which is transparent to incident light into and has opposite flat surfaces, one of said flat surfaces thereof being joined to the other flat surface of said second parallel member, said other flat surface being opposite to the joined surface to said fixing member;
  - d. wherein a Fabry-Perot interferometer is formed based on an airgap positioned between the flat surface of said first parallel member and the flat surface of said transparent member facing each other (Column 2 and Figure 2).
6. Hall teaches the use of two materials of dissimilar coefficient of thermal expansion in a composite in order to effectuate a low coefficient of thermal expansion (Column 4, lines 31-48).
7. Hall fails to teach a second parallel member having an expansion coefficient different from that of said first parallel member wherein the distance between said parallel flat surfaces of said first parallel member, the expansion coefficient of said first parallel member, the distance between said parallel flat surfaces of said second parallel member, and the expansion coefficient of said second parallel member are set so that the temperature dependency of the optical distance of said airgap becomes a predetermined value to thereby set the temperature characteristic of the transmission wavelength characteristic of said Fabry-Perot interferometer to be a predetermined value.

8. ECOC teaches that materials of dissimilar coefficients of thermal expansion can be combined for the purpose of forming an etalon with a low coefficient of thermal expansion (ECOC, Section 3). By choosing the appropriate materials and thicknesses of the materials, the optical distance of the etalon can be set so that the temperature characteristic of the transmission wavelength characteristic of said Fabry-Perot interferometer to be a predetermined value.

9. Since Hall and ECOC share a similar goal in the art, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use separate materials as taught by ECOC for the first and second parallel plates in the system of Hall in order to form an etalon with a low coefficient of thermal expansion, wherein the optical distance of said airgap becomes a predetermined value to thereby set the temperature characteristic of the transmission wavelength characteristic of said Fabry-Perot interferometer to be a predetermined value.

10. Regarding Claim 3, Hall teaches an airgap etalon above wherein said fixing member is transparent to incident light.

11. Hall fails to teach said fixing member is formed with an antireflection coating on a surface opposite to said flat surface and said transparent member is formed with an antireflection coating on the other flat surface thereof opposite to the joined surface to said second parallel member.

12. ECOC teaches antireflection coatings on the entrance and exit sides of an etalon (ECOC, Figure 3). Antireflection coatings are known in the art to be used for the purpose of preventing backreflections.

13. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include antireflection coatings on the entry and exit surfaces of the etalon of Hall as taught by ECOC for the purpose of preventing backreflections.

14. Regarding Claim 4, Figure 3 of Hall teaches an airgap type etalon wherein reflection augmenting coatings (54 and 56) are formed on said flat surfaces of said first parallel member and said transparent member facing each other, respectively.

15. Regarding Claims 6 and 7, Hall teaches Claim 5 above with ECOC but Hall fails to teach a temperature dependency of a transmission wavelength characteristic set to be either 1pm/Degree Centigrade or less or 25pm/Degree Centigrade or less.

16. ECOC teaches that by utilizing known materials of different coefficients of expansion in etalon systems the temperature dependency of a transmission wavelength characteristic can be altered for the purpose of making it close to zero (ECOC, Section 3). The dependency can be approximately 1pm/Degree Centigrade or less (ECOC, Section 3), and therefore less than 25pm/Degree Centigrade, by selecting the proper combination of materials.

17. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a temperature dependency of a transmission wavelength characteristic set to be either 1pm/Degree Centigrade or less or 25pm/Degree Centigrade or less in the system of Hall, since the materials taught by ECOC above would yield a system utilizing a combination of known materials of different coefficients of expansion for the purpose of making a temperature dependency of a transmission wavelength characteristic low.

18. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall and ECOC in view of Shirasaki (US 5,982,488).

19. Regarding Claim 2, Figure 2 of Hall teaches an airgap etalon above with a fixing member transparent to incident light (36) and a transparent member (38).

20. Hall fails to an etalon system wherein the fixing member has a through-hole and fails to teach a first parallel member formed with an antireflection coating on one flat surface thereof, and the flat surface formed with said antireflection coating is joined to said flat surface of said fixing member around said through-hole, and said transparent member is formed with an antireflection coating on the other flat surface thereof opposite to the joined surface to said second parallel member.

21. Shirasaki ('488) teaches the use of through-holes in etalons, especially where the material with the through-hole is used to the advantage of affecting the temperature dependency of a transmission wavelength characteristic (Figures 5A-6B) such that materials of dissimilar coefficients of thermal expansion are combined to affect the optical distance (Summary). The through-hole is further used for the advantage of allowing unobstructed signal transmission (Columns 9-10 and Figures 5B and 6B)

22. ECOC teaches antireflection coatings on the entrance and exit sides of an etalon (ECOC, Figure 3). Antireflection coatings are known in the art to be used for the purpose of preventing backreflections.

23. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a fixing member with a through-hole and the first parallel member

formed with an antireflection coating on one flat surface thereof, and the flat surface formed with said antireflection coating is joined to said flat surface of said fixing member around said through-hole, and said transparent member is formed with an antireflection coating on the other flat surface thereof opposite to the joined surface to said second parallel member in the system of Hall as taught by the ECOC and Shirasaki references. The antireflection coatings are used for the purpose of preventing backreflections, and the through-hole is used to the advantage of affecting the temperature dependency of a transmission wavelength characteristic ('488, Figures 5A-6B) such that materials of dissimilar coefficients of thermal expansion are combined to affect the optical distance ('488, Summary) and for allowing unobstructed signal transmission ('488, Columns 9-10 and Figures 5B and 6B).

### *Conclusion*

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Patent to Cao (US 6,169,604) teaches the use of parallel plates wherein the parallel plates are composed of materials of dissimilar coefficients of thermal expansion for the purpose of allowing one parallel plate to expand and contract in relation to another (Figure 9).

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (703) 305-5424. The examiner can normally be reached on M-F 8-6, with alternating Fridays off.

26. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.



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27. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

ks

January 13, 2003

  
ROBERT H. MCDONALD  
SUPERVISORY PATENT EXAMINER  
TECHNICAL STAFF